

DCMC Commanders Conference

Software Contract Administration Services Tutorial

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Software Concerns*



A'Growing Concern

- In 1995 85% of Software Projects Finished Over Time or Budget
- 1/2 of Projects Double Cost Estimates
- Projects Slip an Average of 36 Months
- 1/3 of Projects roll and ethican Practice, Patricia Sanders, Jan 1999
 *Chart presented by Dr Etter, DUSD(S&T) to DoD Software Collaboration Workshop 30 J



Software CAS Tutorial

Software CAS Tutorial

- M32A (60/20) Video
- Software CAS Chapter Basics
- Capability Maturity Model for Software

Software Center Integrated Plan:

- Software Performance
- Reviews
- CMM Rased Insight
- SPD Questions and Answers





Software CAS - Objectives

Goal

- Evaluate contractor's efforts
- Provide buying activity insight
 By
- Evaluating supplier's processes, plans, and procedures
- Using risk management principles



Software & Supplier Risk Mgmt

Planning

- Review Contract, Line Items, CDRLs and SOW
- Contractor Planning documents
 - Software Development Plan
 - Software Quality Plan
 - Software Risk Management Plan
- Program Documentation
 - MOA
 - Computer Resources Life Cycle Management Plan
 - Test and Evaluation Master Plan



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Software & Supplier Risk Mamt

Risk Assessment

- Assess each key process identified
- Use Software Risk Matrix as guide
 - Performance (reqmt's, bad practices, personnel problems, tools)
 - Schedule (Variances, unfounded, unrealistic)
 - Cost (Variances, unfounded, unrealistic)



Software & Supplier Risk Mgmt

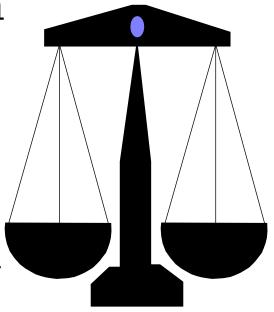
Risk Handling Plan

Process Proofing

Process Auditing

Product Audits

Data collection & analysis





Software & Supplier Risk Mgmt

- Risk Monitoring
 - Execute the plan
 - Reevaluate risk periodically
 - Adjust activities accordingly
- Risk Documentation
 - SPECS
 - RAMP
 - DIRAMS





The Capability Maturity Model

- Basis for new DoD policy
- Industry recognized standard
- Software Development can be:
 - Controlled
 - Measured &
 - Improved



Process Maturity Levels

Optimizin g Managed

Defined

Repeatab le Initial

Process Control **Process** Measurement Process Definition Basic Management Control Ad Hoc Software

Processes





The Software CMM

Key Process Areas

Optimizi

Sefect Prevention
Technology Change Managemen
Process Change Management

Managed

Quantitative Process Management Software Quality Management

Defined

Organization Process Focus
Organization Process Definition
Training Program
Integrated Software Management
Software Product Engineering
Intergroup Coordination
Peer Reviews

Repeatable

Requirements Management
Software Project Planning
Software Project Tracking & Oversight
Software Subcontract Management
Software Quality Assurance
Software Configuration Management

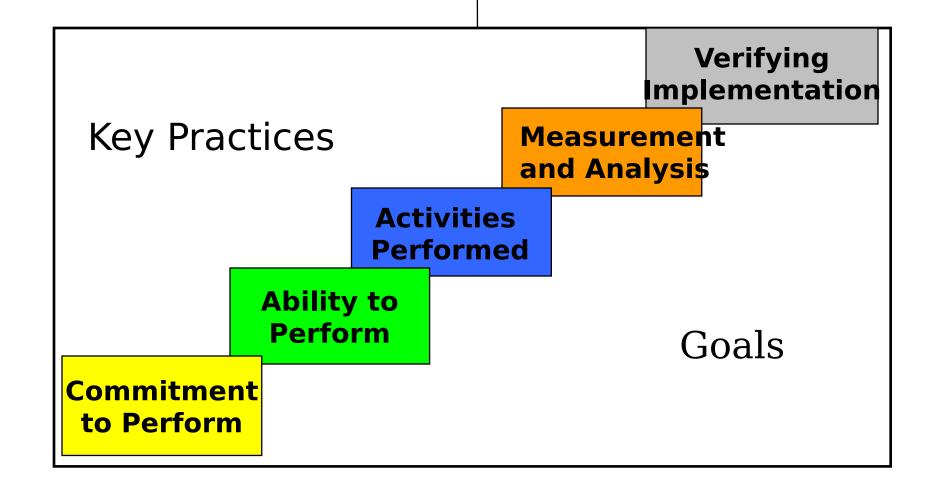
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The Software CMM

Key Process Area





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New OSD Policy (Oct 26, 1999)

Software Evaluations for ACAT 1 Programs

- Use of SCE evaluation tools or equivalent
- Assess business unit proposed to do work
- Contractors not at Level 3
 - Develop a risk mitigation plan and schedule
 - Describe, in detail, actions to correct weaknesses
 - Plan needs Program Manager approval
- Reuse of evaluation results encouraged
- Equivalent will be defined by DUSD(S&T)
- Policy will go into DoD 5000 rewrite



Why we are doing it.



.....The SEI SA-CMM should be used more effectively by DoD to measure performance.

Dr. Delores Etter, Deputy Under Secretary of Defense (Keynote Speaker STC 5/2/99)

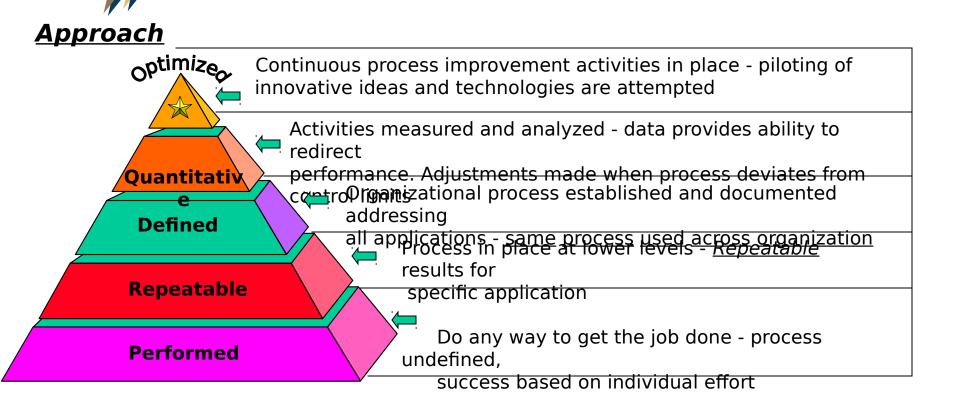


What is the Software Performance Maturity M

- Maturity model used to evaluate performance of Software CAS activities
- Based on the Software Acquisition Capability Maturity Model (SA-CMM)
- Process maturity framework to help DCMC improve their Software CAS process



Software Performance Maturity Mode



The DCMC model is tailored to our Mission from the Software Acquisition - Capability Maturity Model, which was developed by the Software Engineering Institute.

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- Model is based on actual practice and incorporates DCMC best practice
- Review process based on government & industry accepted approach (Software CMM & Software Capability Evaluation - SCE)





One-Book Tracks to the Model

- Software Development Surveillance Chapter covered 100%
- 56% of the key practices have references to the One-Book
- A project goal is to enhance DCMC performance (One-Book) based upon DoD sponsored model (SEI Software Acquisition CMM)



SPMM Goals



Determine the "health" of DCMC CAO activities in the area of Software CAS performance.

 Allow a CAO Commander to identify an existing level of maturity and goals to improve upon S/W CAS activities

 Identify needs to adjust Command training, policy, and / or guidance

Focus DCMC Software Center
 Assistance to CAOs



Concept



- The SPMM project baselines CAO S/W CAS performance and allows the CAO Commander to determine the need for performance improvement
- All applicable One-Book requirements are included in the SPMM features
 - Self-evaluation using the SPMM is effective in providing insight to potential IOA issues by the CAO





Project Events

- Project funded (Oct 98)
- Pilot locations selected by Districts (Nov 98)
- Pilot reviews performed (April 99)
- Pilot review results briefed (May 99)
- → Performance reviews (Oct 99 Mar 00)
- Performance review results brief (April 00)



Pilot Test Approach



- Standardized method, and data collection tools
 - Involved team comprised of Software and EV Center, CAO, and Districts
- Two trained/experienced teams (5 each)
- 6 locations selected by Districts
 (E&W)
- Ouestionnaires provided in advance



Pilot Test Issues



Issues were discussed as they came up.

- SPR objective was not clearly understood
- Perception of added requirements imposed
 - Fear that CAO Commander will demand ultimate level (optimized)
 - Fear of a Command-wide performance level



What it is; what it isn

- The Software Performance Review (SPR)
 is not an audit or assessment
- The SPR results are reported as observations, NOT FINDINGS
- The SPR observations are usable by the CAO as a performance improvement priority tool



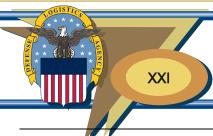
Software Performance Review Tools



KPA Rating Sheets

	KPA: SOFTWARE CAS PLANNING					
					G1:	Software CAS planning documents are prepared early and prior to supplier actions.
					G2:	Software CAS plans encompass all aspects of the acquisition processes as assigned.
Questionnaire Reference		Met	Not Met	Part Met	N/A	NOTES
6-21	Co1					
	Ab1					
1,2,3-21	Ac1					
7-21	Ac2					
10-21	Ac3					
4,5-21	Ac4					
	Me1					
8-21	Ve1					
9,11-21	Ve2					25





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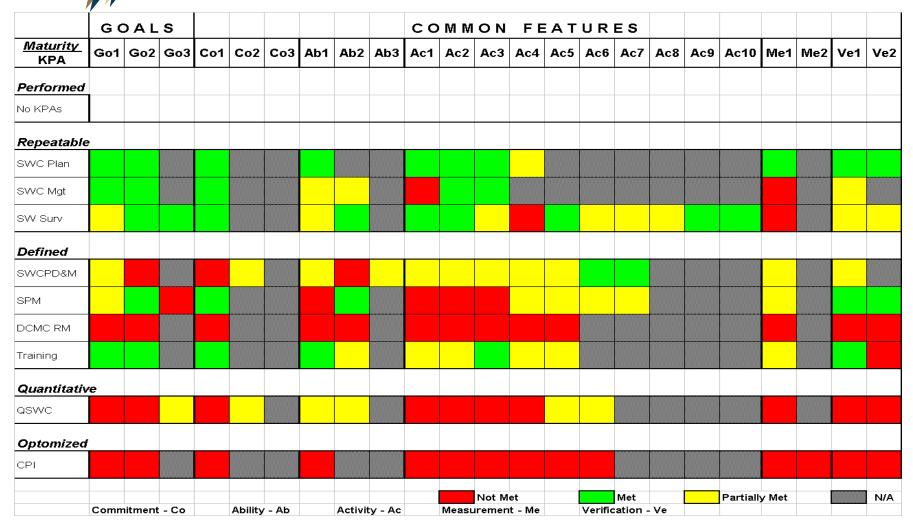
Observations

Software Performance Review Tools



Review process steps **KPA Observations Training & Form Team Software CAS Planning Strengths** - xoxoxoxoxox Weaknesses - xoxoxoxoxox Questionnaire **KPA** Profile **Collect Data** Interviews Discussions Documentati on Review **Analyze Data**







Example of Result Reporting - "Tetris" Profile

Repeatab	le			Defined				Quantitative	Optimized
	SW CAS Mgmt	Supplier Tracking & Insight	Supplier Process & Product Evaluation	Process Definition & Maintenance	Supplier Performance Management	DCMC Risk Mgmt	Training		Continuous Process Improvem't
Co 1	Co 1	Co1	Co1	Co1	Co 1	Co 1	Co1	Co 1	Co 1
Co 2	Co 2	Co2	Co2	Co2	Ab 1	Co 2	Co2	Co2	Co 2
Ab 1	Ab 1	Ab 1	Ab 1	Co3	Ab 2	Ab 1	Ab 1	Ab 1	Co 3
Ac 1	Ab 2	Ab 2	Ab 2	Ab 1	Ac 1	Ab 2	Ab 2	Ab 2	Ab 1
Ac 2	Ab 3	Ab 3	Ab 3	Ab 2	Ac 2	Ab 3	Ab 3	Ac 1	Ab 2
Ac 3	Ab 4	Ac 1	Ac 1	Ab 3	Ac 3	Ac 1	Ac 1	Ac 2	Ac 1
Ac 4	Ac 1	Ac 2	Ac 2	Ab 4	Ac 4	Ac 2	Ac 2	Ac 3	Ac 2
Ac 5	Ac 2	Ac 3	Ac 3	Ac 1	Ac 5	Ac 3	Ac 3	Ac 4	Ac 3
Me 1	Ac 3	Ac 4	Ac 4	Ac 2	Ac 6	Ac 4	Ac 4	Ac 5	Ac 4
Ve 1	Me 1	80	Me 1	Ac 3	Me 1	Ac 5	Ac 5	Ac 6	Ac 5
Ve 2	Ve 1	Ac 6	Ve 1	Ac 4	Ve 1	Me 1	Me 1	Me 1	Ac 6
		Ac 7	Ve 2	Ac 5	Ve 2	Ve 1	Ve 1	Ve 1	Me 1
		Me 1		Ac 6		Ve 2	Ve 2	Ve 2	Me 2
		Ve 1		Me 1					Ve 1
		Ve 2		Ve 1					Ve 2
G1	G1	G1	G1	G1	G1	G1	G1	G1	G1
G2	G2	G2	G2	G2	G2	G2	G2	G2	G2
				G3	G3		G3	G3	G3
					G3				

Software Performance Maturity Mode

CAO Results

		Key Process Area	Rating
Optimized →		Software CAS Continuous Process Improvement	
Quantitative →		Quantitative Software CAS	
		Training	
Dofinad		DCMC Risk Management	
<u>Defined</u>		Supplier Performance Management	
		Software CAS Process Definition and Maintenance	
		Software Surveillance	
Repeatable		Software CAS Management	
		Software CAS Planning	









Sample Observation



Software CAS Planning

The purpose of Software CAS Planning is to ensure that all reasonable planning for the Software Acquisition is conducted and that all elements of the project are included.

STRENGTHS

Software Surveillance Plans in place and have been distributed.

WEAKNESSES

No CAO Software Facility Plan or strategy is currently in place.

No measurements are currently being made by management of the Software CAS Planning activities.

No single CAO process in place for contract review, Government rights, or Government Furnished Equipment.

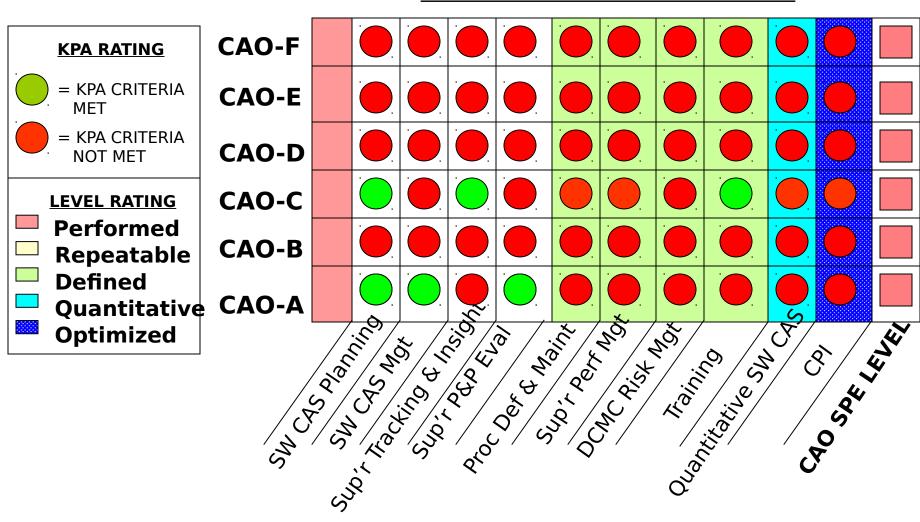
CAO management demonstrates a minimal level of awareness of the use of SPECS as a resource estimating tool for Software CAS activities.



Pilot Results



KPA SATISFACTION PROFILE







CMM Based Insight

- Surveillance Strategy + Risk

 Management + Industry Recognized

 Standard = Process Related

 Information
- Activities Mapped to SW CMM
- Observations Generated and Classified
 - Strengths & Weaknesses identified
 - Key process assessment performed
- Pilot underway, implementation target: July 2000





CMM Based Insight

Rolls and Responsibilities:

- All Software Professionals will make observations
- A trained analyst will determine if higher level components of CMM are achieved



Level III Update

- Level III: CMM Based Insight (CBI)
 Analyst
 - Purpose
 - Facilitate the implementation of CBI at respective CAO
 - Analyze data to determine health of Process Areas
 - Coordinate process related information with contractors software process owners



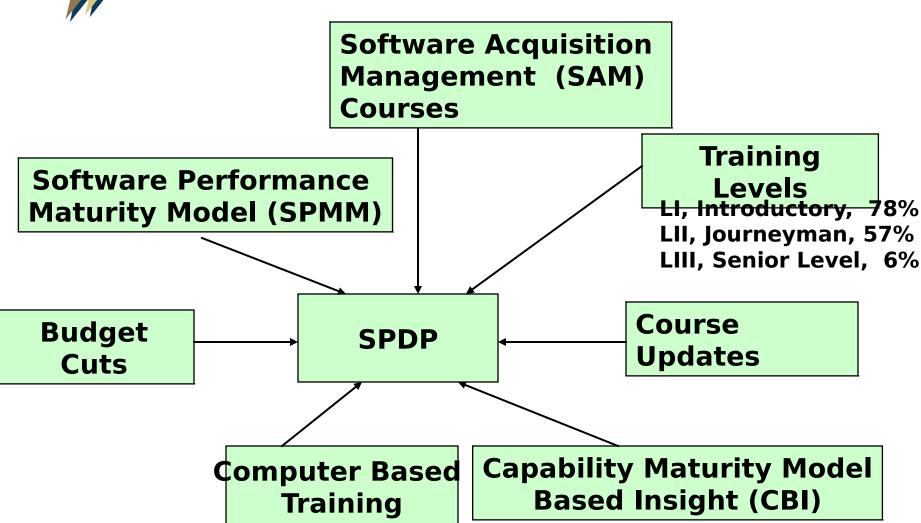
Level III Update

- Level III: CMM Based Insight (CBI)

 Analyst (continued)
- Requirements
 - Currently certified Level II or III
 - Seven or more years experience in software development related activities
 - At least two years of DoD Software CAS
- Training
 - Software Capability Evaluation (SCE) version 3
 - CMM Based Insight Analyst Course



Software Professional Development Program





SPDP Transition Plan

SPDP CBT Transition Plan for Existing Level II Candidates					
Duran dan ya Dia ay daga ya ay ak	Navy Dagwiya ya sat				
Previous Requirement	New Requirement				
ADA	C++Programming Language Track				
System Analysis and Design (SXX)	System Analysis Fundamentals				
System marysis and Design (5707)	Data Flow Diagram				
	Entity Relationship Diagrams				
	Data Dictionary				
Software Surveillance Application Mentoring	Software CAS Application Mentoring				
Software Surveillance Application (SSA)	Software CAS Application				
Software Surveillance Evaluation Mentoring	Software CAS Evaluation Mentoring				
Software Surveillance Evaluation (SSE)	Software CAS Evaluation				
Capability Maturity Model (CMM)	Capability Maturity Model (CMM)				



SPDP Training Curriculum

SPDP Mandatory Tracks for Certification

Software Surveillance Fundamentals Track	<u>Source</u>
Basic Software Acquisition Management (BSAM)	CBT
C Programming Language Track	CBT
Microsoft Windows Architecture: Fundamentals	CBT
Microsoft Windows Architecture: Advanced	CBT
Microprocessor Fundamentals	? (upgrade class)
Software Surveillance Fundamentals Mentoring	OJT
Software Surveillance Fundamentals (SSF)	Classroom

Level I

Software Surveillance Application Track	<u>Source</u>
Systems Analysis Fundamentals	CBT
Data Flow Diagrams	CBT
Entity Relationship Diagrams	CBT
Data Dictionaries	CBT
Database Fundamentals	CBT
Software Surveillance Application Mentoring	OJT
Software Surveillance Applications (SSA)	Classroom

Level II



SPDP Training Curriculum

SPDP Mandatory Tracks for Certification (continued)

Software Surveillance Evaluation Track	<u>Source</u>	
Principles of Object-Oriented Programming: I	CBT	
Principles of Object-Oriented Programming: II	CBT	
Object-Oriented Analysis: Objects & Classes	CBT	
Object-Oriented Analysis: Dynamic Modeling	CBT	
Object-Oriented Design	CBT	
C++ Programming Language Track	CBT	
Project Management: Fundamentals	CBT	
CMM	Classroom	
Software Surveillance Evaluation Mentoring	OJT	
Software Surveillance Evaluation (SSE)	Classroom	

Level II





Deployment

- SPDP Training Guide
 - Currently being updated to reflect changes in training program
- Computer Based Training
 - Now Available
 - http://maestro.den.disa.mil/dlacbt/Default4.
 asp
- Software Training Matrices

• In development SPDP Lead Agent (617) 753-3614 kbutera@dcmde.dl a.mil

Mark Keenan SPDP Program Manager (617) 753-3740 mkeenan@dcmde.d



Summary

DCMC Software CAS is moving in the right direction

- In step with OSD policy
 - CMM Based Insight
 - Increased emphasis on risk management
- Improving as an organization
 - Software Performance Maturity Model and Software Performance Reviews
 - SPDP Update

